

## TC-8900 All-in-one Controller Units and ES-8930 Remote Setpoint Module

### Introduction

TC-8900 is a family of analogue controllers, designed for the control of fan coils with 2 pipe, 2 pipe with change-over, 2 pipe with electrical coil, or 4 pipe configurations.

The family includes All-in-one Controller Units (TC-8900), a Remote Set point Module (ES-8930) and Built-in Controller Units (TC-8930).

The TC-8900 has been designed to be easy to use, while integrating the most common room air conditioning control functions.



TC-8900 All-in-one Controller Unit



ES-8930 Remote Setpoint Module with TC-8930  
Built-in Controller Unit

### Features and Benefits

- |                                                                                                                                                                                                                            |                                                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| <input type="checkbox"/> <b>All in one condensed package: sensor, direct/reverse input, window input, PI control, up to two valve outputs, mode (comfort/stand-by) push button and setpoint readjustment potentiometer</b> | Provides better value for money in the smallest package                     |
| <input type="checkbox"/> <b>Option to limit the setpoint adjustment range or to cancel the setpoint adjustment</b>                                                                                                         | Usability in critical environments where limited adjustability is preferred |
| <input type="checkbox"/> <b>Active or passive input</b>                                                                                                                                                                    | Flexibility on the input: temperature, humidity, differential pressure etc. |
| <input type="checkbox"/> <b>Modern and discreet cover which snaps onto a plug-in mounting base</b>                                                                                                                         | Blends in with room décor. Easier installation                              |
| <input type="checkbox"/> <b>Electric terminals located on mounting base</b>                                                                                                                                                | Easier wiring and commissioning                                             |
| <input type="checkbox"/> <b>Standard range of mounting kits</b>                                                                                                                                                            | Mounting flexibility                                                        |

## Ordering data

| All-in-one Controller Units | Output    | Sensor input* |
|-----------------------------|-----------|---------------|
| TC-8903-1131-WK             | 1xPAT     | Built-in NTC  |
| TC-8901-2131-WK             | 2x0...10V | Built-in NTC  |
| TC-8904-2131-WK             | 2xDAT     | Built-in NTC  |
| TC-8906-2131-WK             | 2xOn/Off  | Built-in NTC  |
| TC-8903-1132-WK             | 1xPAT     | Remote NTC    |
| TC-8901-2132-WK             | 2x0...10V | Remote NTC    |
| TC-8904-2132-WK             | 2xDAT     | Remote NTC    |
| TC-8906-2132-WK             | 2xOn/Off  | Remote NTC    |

- Setpoint range: 12...28°

| All-in-one Controller Units | Output | Sensor input* |
|-----------------------------|--------|---------------|
| TC-8903-1151-WK             | 1xPAT  | Built-in NTC  |
| TC-8903-1152-WK             | 1xPAT  | Remote NTC    |

- Setpoint range: 0...40°

| All-in-one Controller Units | Output    | Sensor input*  |
|-----------------------------|-----------|----------------|
| TC-8903-1183-WK             | 1xPAT     | Remote 0...10V |
| TC-8901-2183-WK             | 2x0...10V | Remote 0...10V |

- Setpoint range: 0...100%

\*Remote sensor input: see "Specifications" last page of this document

| Built-in Controller Units | Output    | Sensor input* |
|---------------------------|-----------|---------------|
| TC-8933-1112-W            | 1xPAT     | From ES       |
| TC-8931-2112-W            | 2x0...10V | From ES       |
| TC-8934-2112-W            | 2xDAT     | From ES       |
| TC-8936-2112-W            | 2xOn/Off  | From ES       |

- Setpoint range: remote, see ES-8900

| Remote Setpoint Module | Output | Sensor input* |
|------------------------|--------|---------------|
| ES-8930-3031-WK        | -      | Built-in NTC  |

- Setpoint range: 12...28°C

## Accessories

Accessories (order separately)

| Order code     | Description                                           |
|----------------|-------------------------------------------------------|
| TM-9100-8900   | Opening tool for sensor case                          |
| TM-9100-8901   | Dial stop screws kit (bag of 100 self tapping screws) |
| TM-9100-8931-W | Plastic surface mounting kit                          |
| TM-9100-8941-W | Wall box mounting kit                                 |
| TM-9100-8951-W | Panel mounting kit                                    |

See "RS-9100 product bulletin" for details on accessories.

## Technical characteristics - models with NTC sensor input

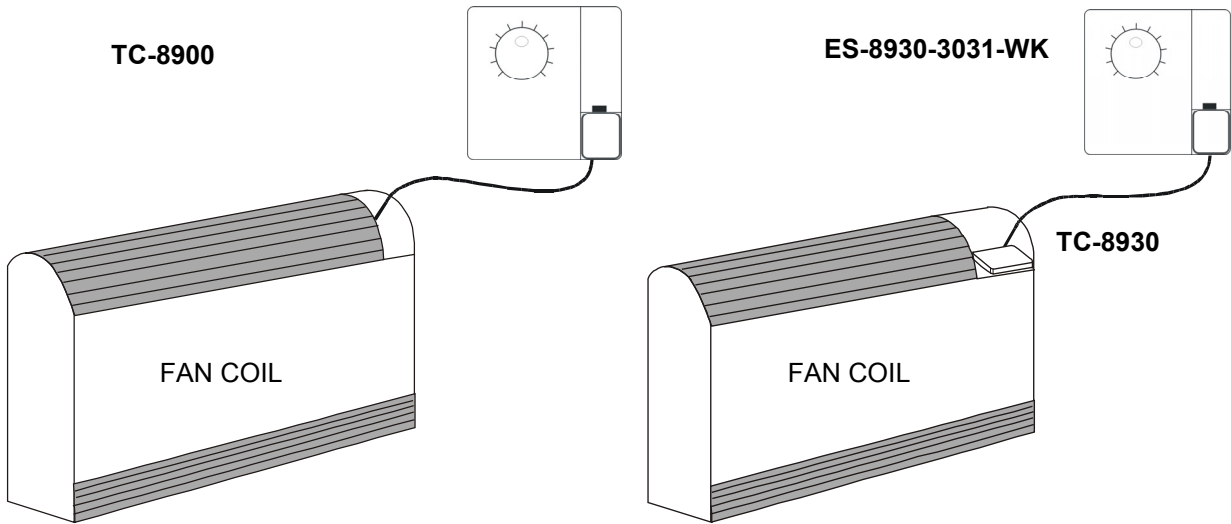
| Models             | TC-8901 series | TC-8903 series   | TC-8904 series | TC-8906 series |
|--------------------|----------------|------------------|----------------|----------------|
| Dead Band          | 0 to 2 K       | -                | 0 to 2 K       | 0 to 2 K       |
| Differential       | -              | -                | -              | 0.2 to 2 K     |
| Proportional Band  | 1...4 K        | 2...8 K          | 1...4 K        | -              |
| Time base          | -              | 120 seconds      | 5...15 minutes | -              |
| Integral Time      | -              | Off or 4 minutes | -              | -              |
| Standby Offset BSB | 2 K            | 2 K              | 2 K            | 2 K            |
| Window Offset BOF  | 5 K            | 5 K              | 5 K            | 5 K            |

## Technical characteristics - models with 0...10V sensor input

| Models             | TC-8901-2183-WK | TC-8903-1183-WK  |
|--------------------|-----------------|------------------|
| Dead Band          | 0 to 10%        | -                |
| Proportional Band  | 5 to 20%        | 10 to 40%        |
| Integral Time      | -               | Off or 4 minutes |
| Standby Offset BSB | 10%             | 10%              |
| Window Offset BOF  | 25%             | 25%              |

## Application

The TC-89x0 Controllers operate either wall mount or fan coil mount, optionally receiving the set point from the Remote Setpoint Module.



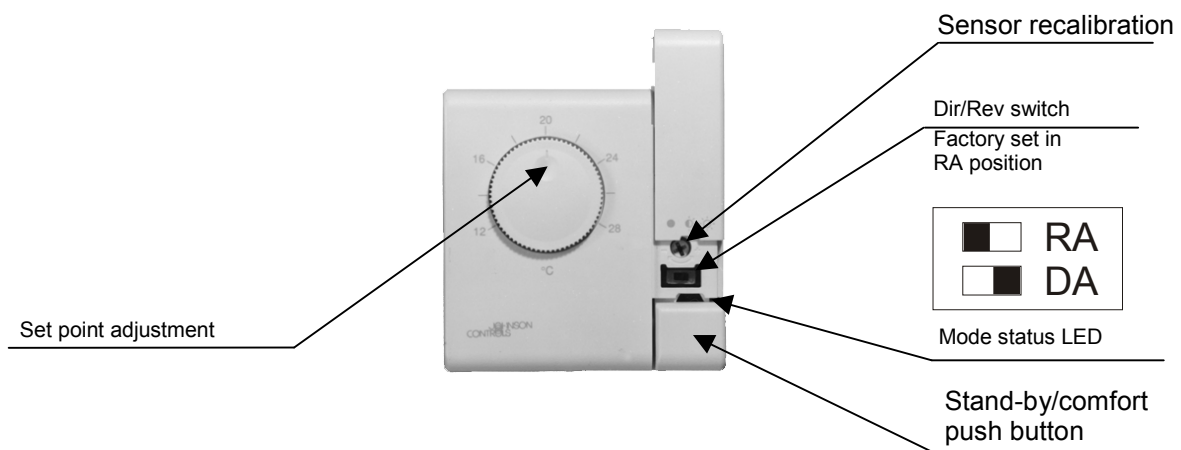
“All-in-one Controller Unit”, wall mount

Unit mount “Built-in Controller Unit”, with “Remote Setpoint Module”

## Adjustment

### Front description

- TC-8900 and ES-8930 (sliding cover open)



| LED status |          | Mode Status |
|------------|----------|-------------|
|            | on       | comfort     |
|            | blinking | stand-by    |
|            | off      | Window open |

- TC-8930

No front adjustment

## Back description

### TC-8900 and TC-8930

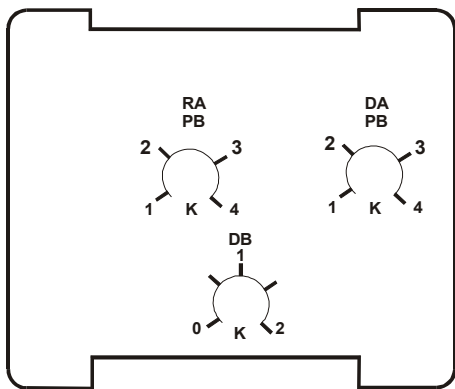
**PB:** Proportional band

**DB:** Dead band

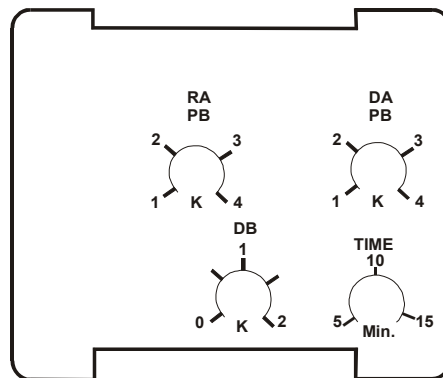
**Tn:** Integral time for PAT

**Time:** Time base for DAT

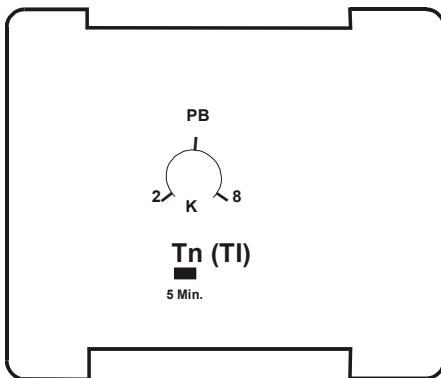
**Diff:** Differential for on/off control



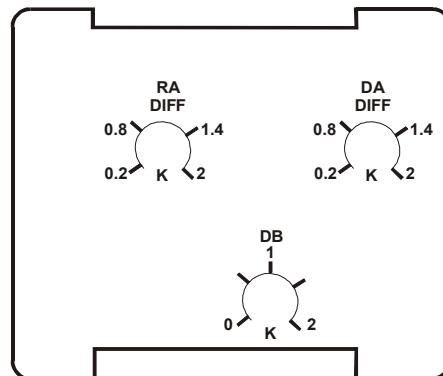
TC-89X1 (0...10 V)



TC-89X4 (DAT)



TC-89X3 (PAT) (factory default – jumper closed  
TI= 4 min)



TC-89X6 (ON/OFF)

**Factory settings: All trimmers are set at middle value.**

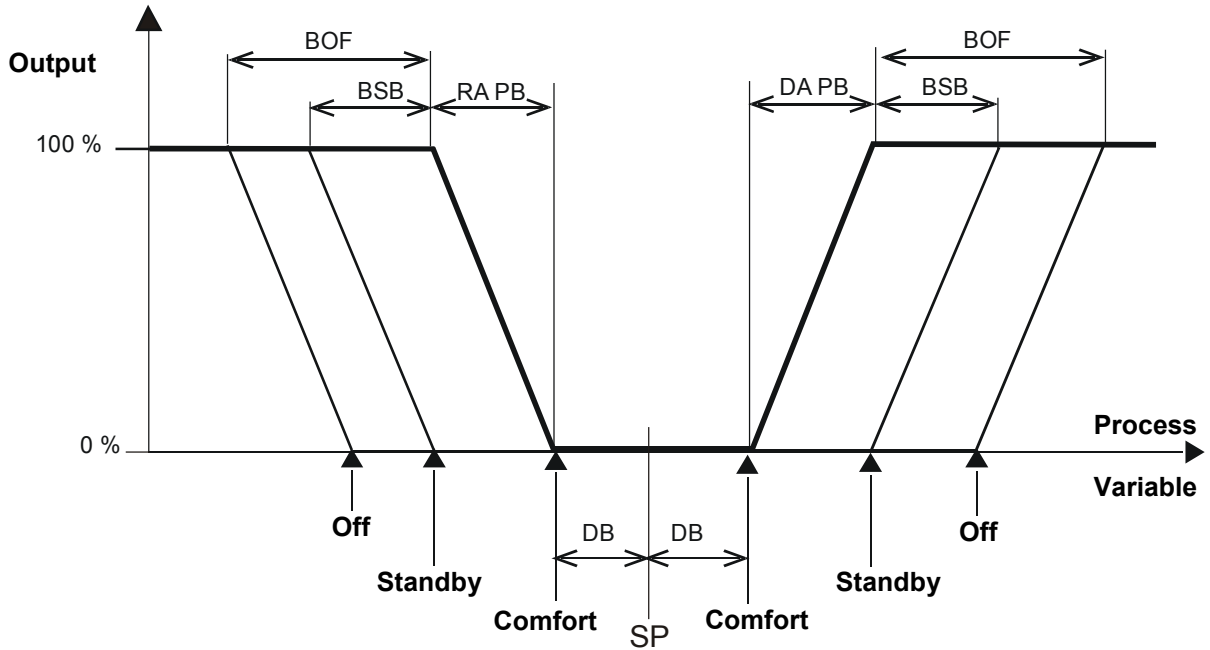
### ES-8930

No back adjustment

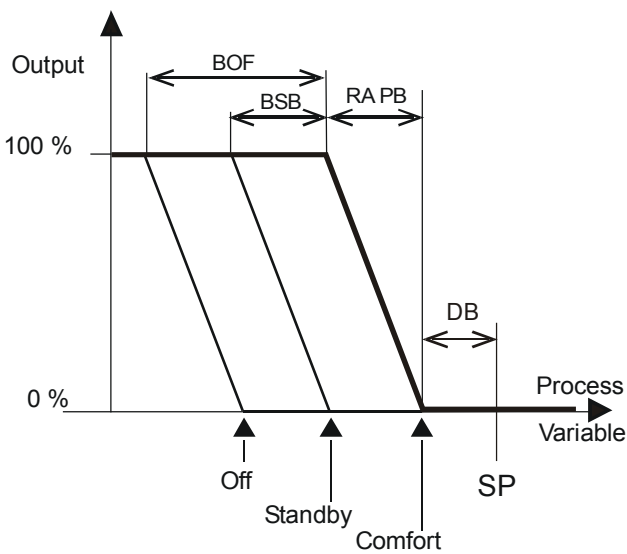
## Operation

- SP:** Setpoint
- PB:** Proportional band
- DB:** Dead band
- BSB:** Standby offset
- BOF:** "Window open" offset

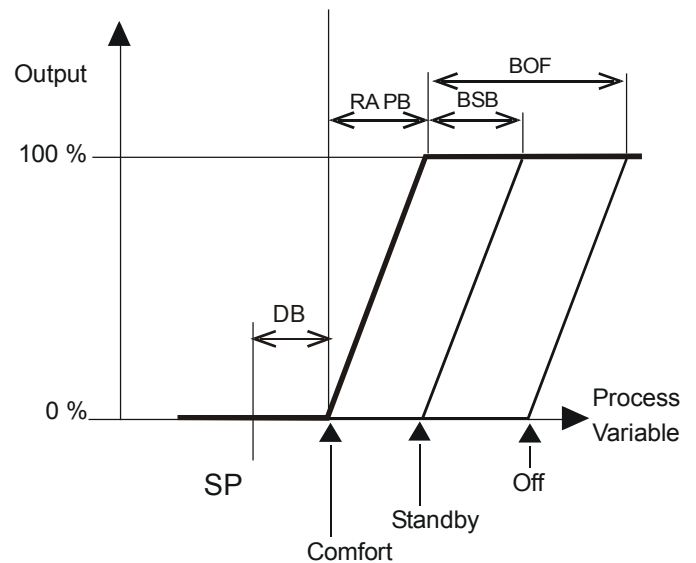
### 2x0...10V Outputs (e.g. 4-pipe system)



### 1x0...10V DA or RA Output (2-pipe system with change-over, use the "RA" output of the controller)

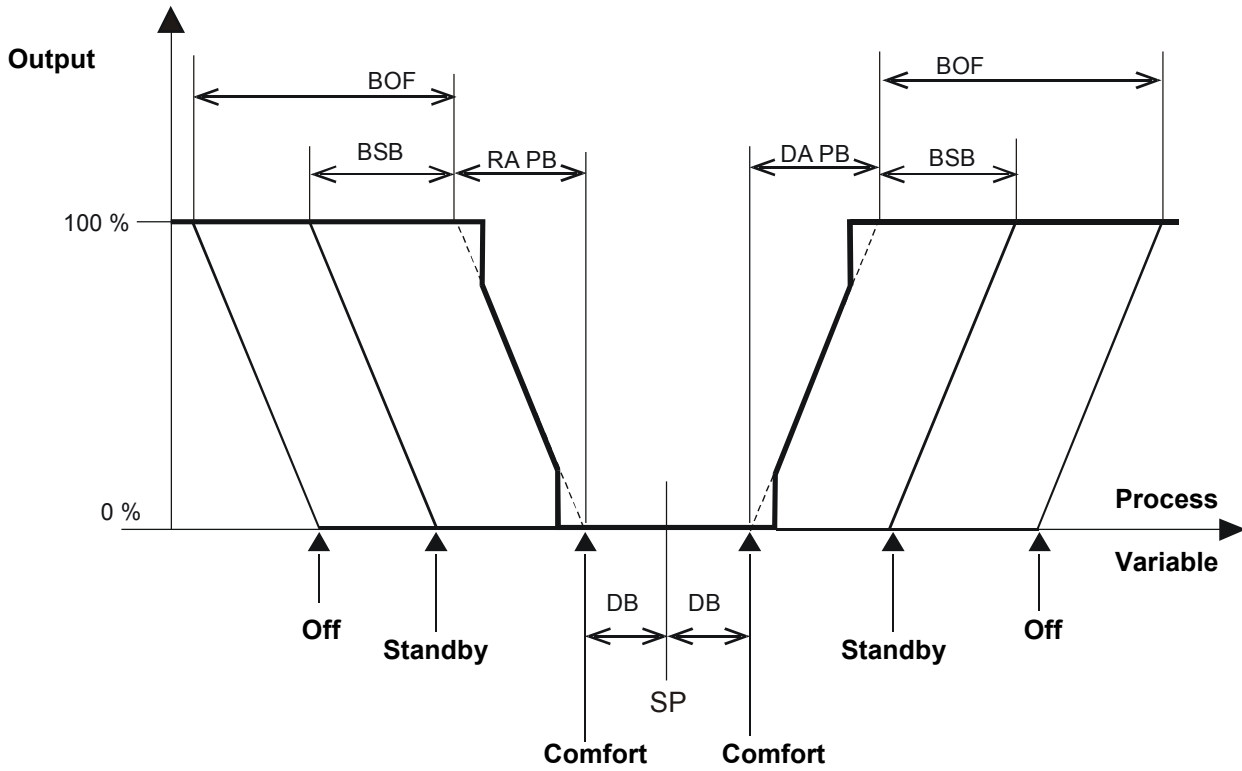


**RA (Reverse acting)**

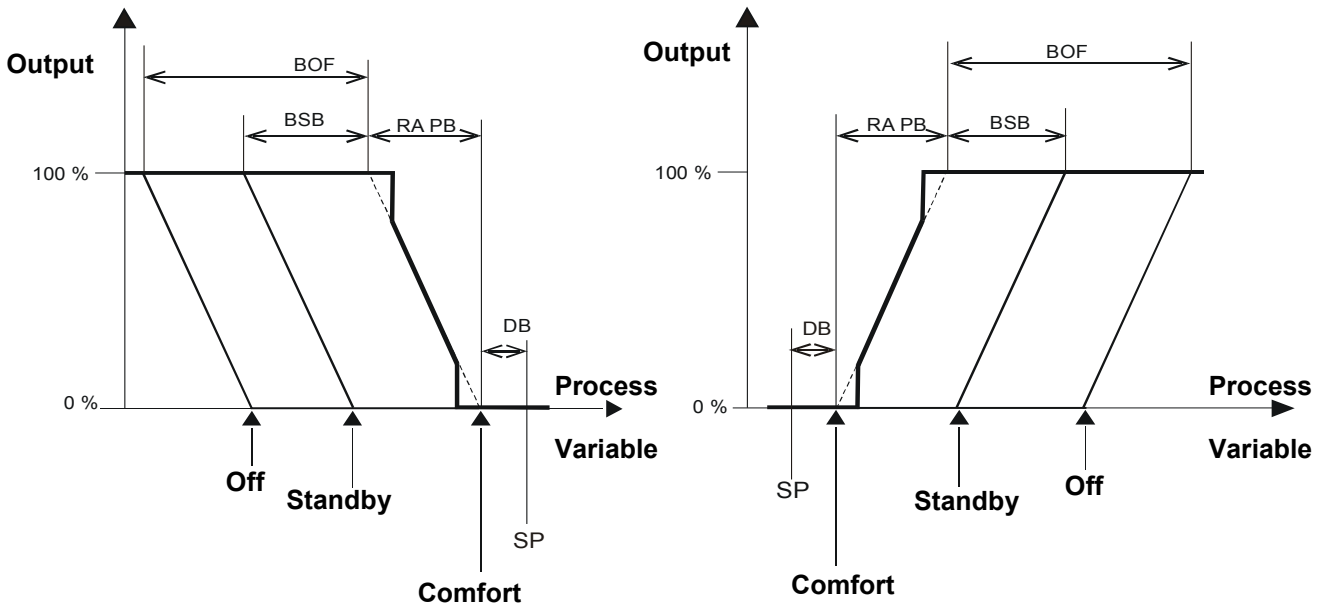


**DA (Direct acting)**

**2XDAT Outputs** (e.g. 4-pipe system)



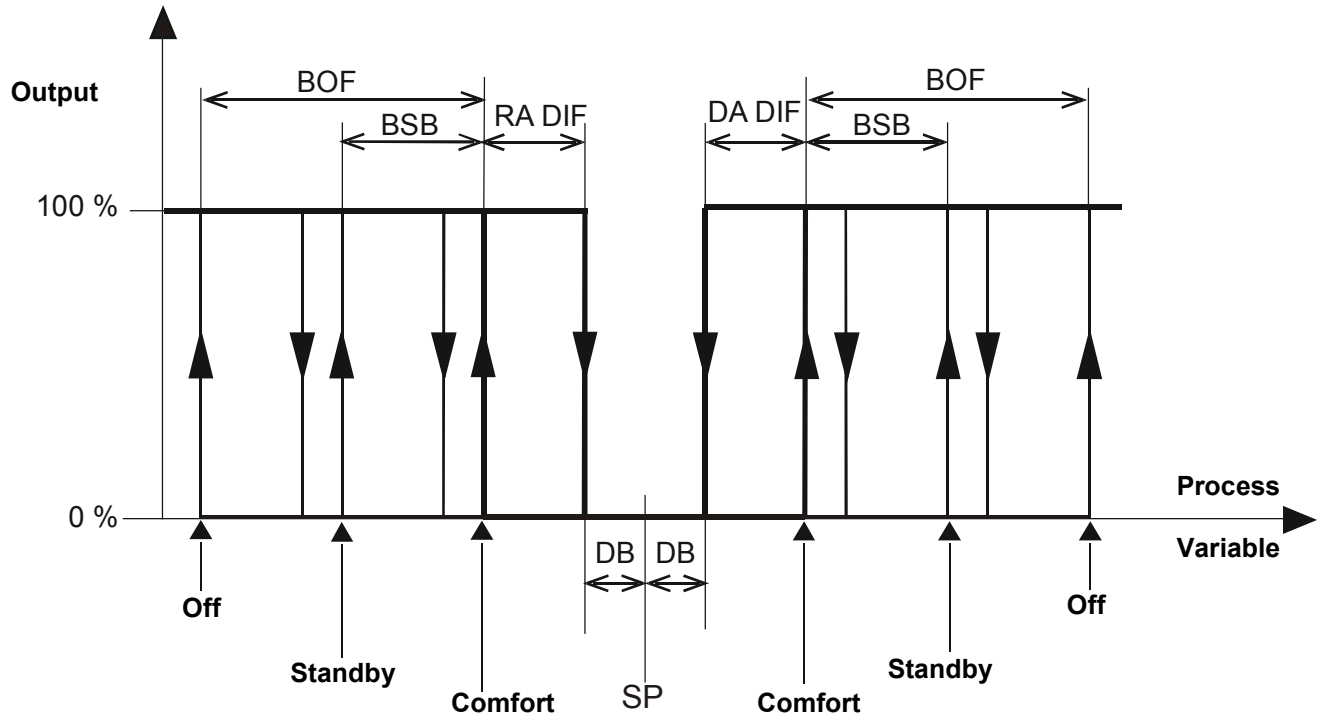
**1XDAT DA or RA Output** (2-pipe system with change-over, use the "RA" output of the controller)



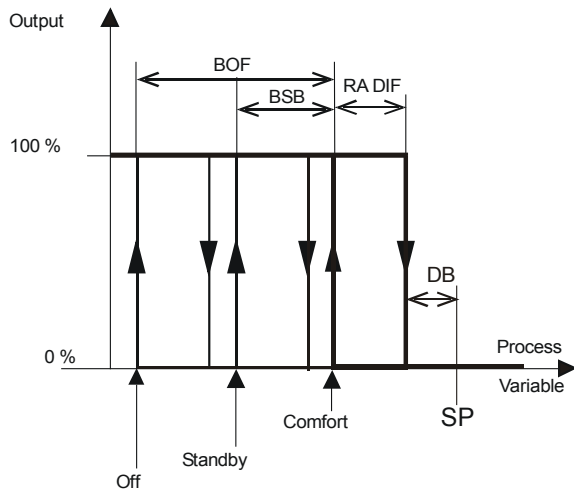
**RA (Reverse acting)**

**DA (Direct acting)**

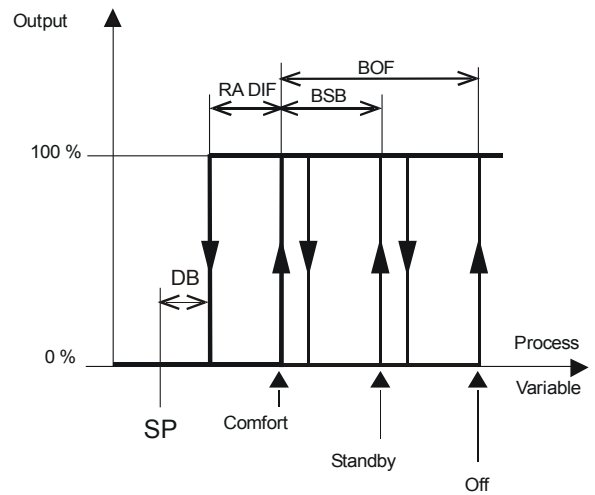
**2xOn/Off Outputs** (e.g. 4-pipe system)



**1xOn/Off DA or RA Output** (2-pipe system with change-over, use the "RA" output of the controller)



**RA (Reverse acting)**



**DA (Direct acting)**

# Wiring Diagram

The following drawings indicate the connection diagrams of the different stand alone models and Remote Setpoint Module.

The contacts have the following functions:

Window contact (  ): Window closed = contact closed

Dir /Reverse contact (  ): Direct (summer) = contact closed

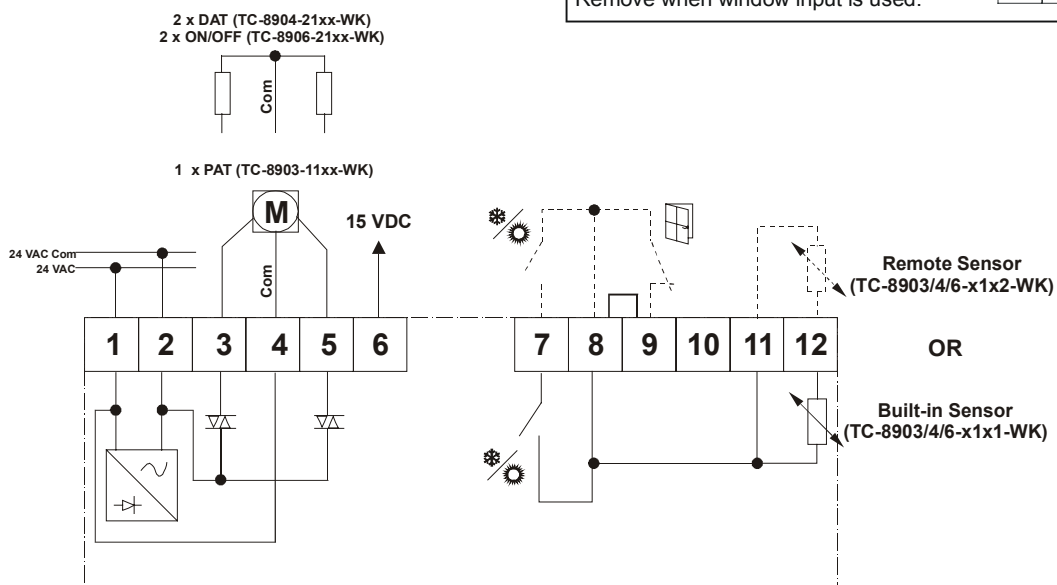
Reverse (winter) = contact open

A change-over thermostat can be connected to terminals 7 and 8. In that case the internal contact must be fixed at winter (open).

| Models          | Diagram n° |
|-----------------|------------|
| TC-8903-1131-WK | 1          |
| TC-8901-2131-WK | 2          |
| TC-8904-2131-WK | 1          |
| TC-8906-2131-WK | 1          |
| TC-8903-1132-WK | 1          |
| TC-8901-2132-WK | 2          |
| TC-8904-2132-WK | 1          |
| TC-8906-2132-WK | 1          |

| Models          | Diagram n° |
|-----------------|------------|
| TC-8903-1151-WK | 1          |
| TC-8903-1152-WK | 1          |
| TC-8903-1183-WK | 3          |
| TC-8901-1283-WK | 4          |
| TC-8933-1112-W  | 5          |
| TC-8931-2112-W  | 5          |
| TC-8934-2112-W  | 5          |
| TC-8936-2112-W  | 5          |
| ES-8930-3131-WK | 5          |

## Diagram 1



**PAT models (TC-8903) : terminals 3 & 5 functions**

| Jumper Action Position | Temperature (*) | Terminal Energised |     |
|------------------------|-----------------|--------------------|-----|
|                        |                 | 3                  | 5   |
| RA                     | ↑               | ON                 | OFF |
|                        | Set point       | OFF                | OFF |
|                        | ↓               | OFF                | ON  |
| DA                     | ↑               | OFF                | ON  |
|                        | Set point       | OFF                | OFF |
|                        | ↓               | ON                 | OFF |

(\*) ↑ Temperature increase      ↓ Temperature decrease



Diagram 2

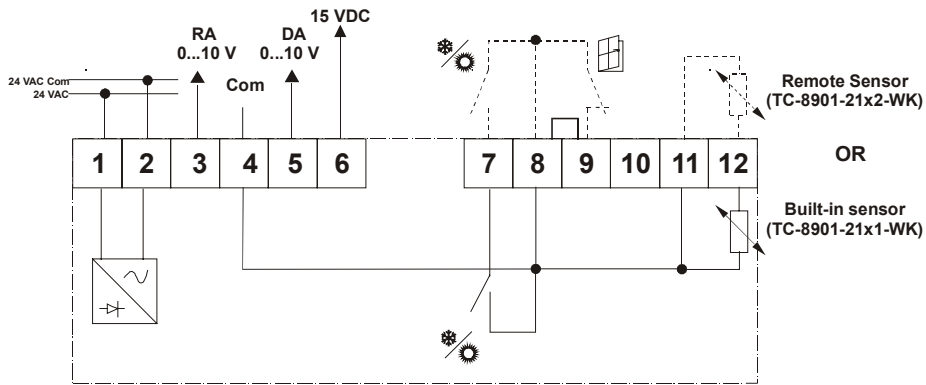


Diagram 3

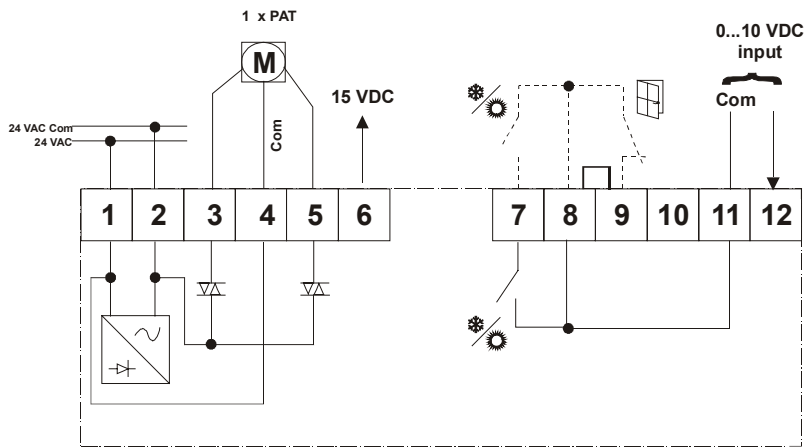
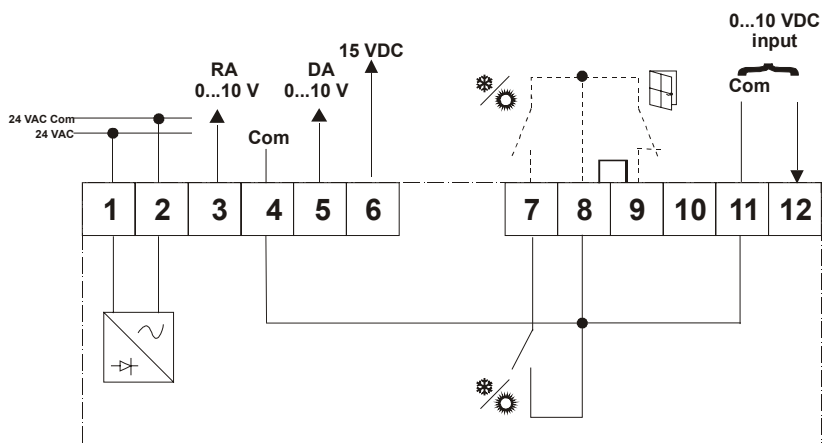


Diagram 4



**Note:**  
 On TC-890X Window Jumper factory set.  
 Remove when window input is used.

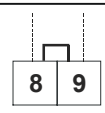
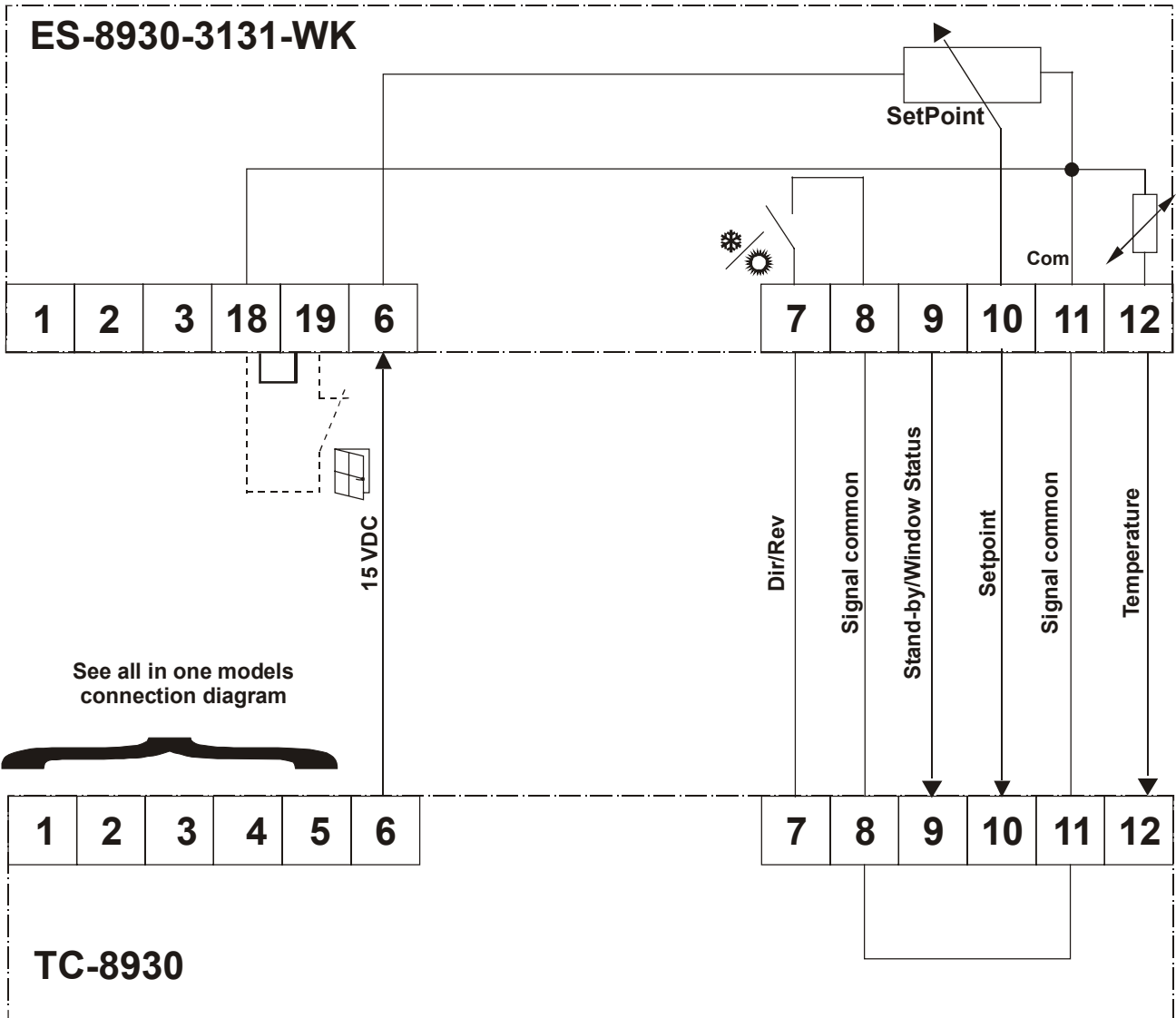
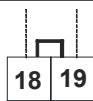


Diagram 5

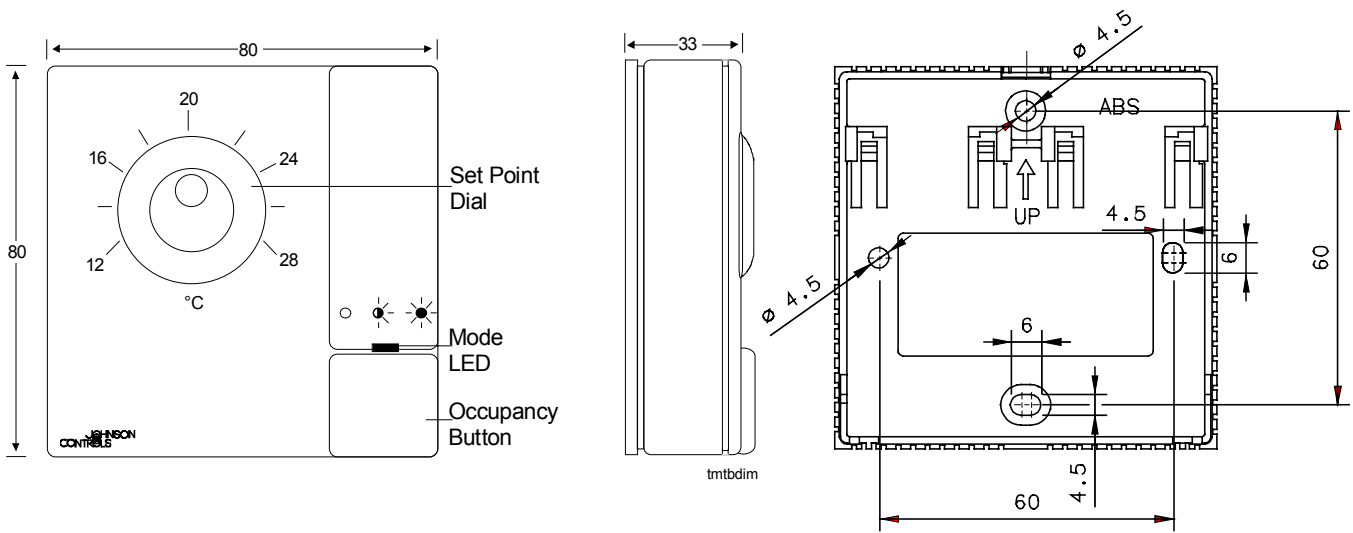


**Note:**

On ES-8930 Window Jumper factory set. Remove when window input is used.



# Dimensions (in mm)



**TC-8900 series stand alone and ES-8930**

**TC-8930 series has the same external dimensions as TC-8900, without setpoint dial, push button, LED and sliding cover.**

## Specifications

| Models                               | TC-89x0                                                                                                                                                                                                          | ES-8930             |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| <b>Supply</b>                        | 24VAC ±15%                                                                                                                                                                                                       | Supplied by TC-8930 |
| <b>Power consumption</b>             | 1.5 VA with no load                                                                                                                                                                                              | ---                 |
| <b>Output</b>                        | TC-89x1: 0...10V 10mA max<br>TC-89x3/4/6: triac 0,5A max<br>24VAC                                                                                                                                                | ---                 |
| <b>Sensor ricalibration</b>          | CW + 0.8 °C<br>CCW - 0.8 °C                                                                                                                                                                                      | ---                 |
| <b>Remote sensor</b>                 | <ul style="list-style-type: none"> <li>• NTC K10 10kΩ at 25°C (TE-9100-8502 or TS-9104 Sensor series)</li> <li>• 0...10V (input impedance &gt;50kΩ) (TS-9101, HT-9000, PS-910x PT-910x Sensor series)</li> </ul> |                     |
| <b>Ambient operating temperature</b> | 0...50°C                                                                                                                                                                                                         |                     |
| <b>Humidity range</b>                | 0 to 95% not condensing                                                                                                                                                                                          |                     |
| <b>Storage temperature</b>           | -20 +70°C                                                                                                                                                                                                        |                     |
| <b>Mode indicator</b>                | Red LED to indicate comfort (ON), standby (blinking), off (OFF), not available on TC-8930                                                                                                                        |                     |
| <b>Mounting</b>                      | Direct surface mount, plastic base for surface mount with wiring conduits, and recessed wall box and panel mounting kits. (See Ordering Codes.)                                                                  |                     |
| <b>Housing</b>                       | Material: ABS + polycarbonate, self-extinguishing VO UL94.<br>Protection: IP30 (IEC529)<br>Color: RAL-9010 pure white                                                                                            |                     |
| <b>Dimensions (H x W x D)</b>        | 80 mm x 80 mm x 33 mm                                                                                                                                                                                            |                     |
| <b>Shipping Weight</b>               | 0.15 kg                                                                                                                                                                                                          |                     |
| <b>CE Compliance:</b>                | EMC (89/336 EEC) according to the standard EN 50081-1 and EN 50082-1                                                                                                                                             |                     |

**\* Note: other technical characteristics can be found in page 2**

*The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office or representative. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products.*